

# EE 602 Analytical Methods (Fall 2009)

## Text Book:

Gilbert Strang, *Linear Algebra and Its Applications*, Fourth Edition, Thomson Brooks/Cole (2006) ISBN 0-03-010567-6.

Textbook web site: <http://web.mit.edu/18.06/www>

## Reference Book:

P. Lancaster and M. Tismenetsky, *The Theory of Matrices*, Second Edition, Academic Press, 1985.

## Instructor:

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## Grading Policy:

Mid-term Exam 40%

Final Exam (comprehensive) 60%

Homework will be assigned regularly. Possible revision of test grades may be discussed immediately following the return of the test papers or the announcement of grades (no later than a week from it). No make-up tests.

Any act of academic dishonesty will result in a failing grade.

## Schedule of Topics (tentative):

Week 1 – Matrix operations, special properties, Laplace's Theorem, Binet-Cauchy formula

Week 2 – Elementary operation, LU decomposition

Week 3 – Vector spaces and linear independence, linear systems theory

Week 4 – Linear algebraic equations, consistency test, solution techniques

Week 5 – Eigenvalues and eigenvectors, diagonalization of square matrices

Week 6 – Linear differential equations, state space representation

Week 7 – Midterm exam

Week 8 – Solutions to state space equations

Week 9 – The matrix exponential, functions of matrix

Week 10 – Quadratic forms, positive definite matrix

Week 11 – Controllability and observability

Week 12 – Nonnegative matrices, stochastic matrices (optional)

Week 13 – Special topics, application examples (optional)

Week 14 – Review